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THE STEREOPTICON IN SECONDARY TEACHING¹

1. *Why use a stereopticon?*—We remember not words, but objects. We recall not descriptions, but the images derived from descriptions. No man, be he ever so eloquent, can give to pupils, in words, so good an idea of the Aphrodite of Melos as a fifteen-cent photograph. All our materials for thought-images are derived from what we ourselves have seen or have comprehended in terms of our own experience. In teaching (especially in the classics and ancient history) many things are so remote from the personal experience of our pupils that their ideas will be inaccurate, vague, and nebulous, unless we give them definite images. Talk for half an hour giving purely a verbal description of the Parthenon—how clear an idea does your average pupil have of it? Show him a picture, call his attention to various points—then his knowledge crystallizes, and he has an image that he will retain for years. Therefore, whatever increases the stock of clear-cut images in our pupils' minds must be of great aid in extending their knowledge and in enkindling interest. For this purpose no other one thing can equal views shown by an optical lantern. Illustrations in books and photographs are excellent, but cannot equal the lantern in at least two respects: first, owing to the darkening of the room there is nothing to distract pupils, hence voluntary and involuntary attention both center on the screen; this concentration of attention inevitably leads to sharp impressions and vivid recollections; second, the attention of an entire class is focused on the same thing at the same time—something impossible with any other form of illustration.

2. *Lanterns and screens.*—The lantern itself may cost from almost nothing to a very large sum. Three elements are to be considered: the light, the condensing lenses, and the projecting lens.

¹ Outline of a paper presented, with several practical illustrations, at the Classical Conference held at Ann Arbor, Mich., March 29, 1901.

Sunlight costs nothing, but some form of *porte lumière* is necessary. An ingenious boy can make the whole apparatus (the mirror excepted) from illustrations in texts on physics, or from cuts in Dolbear's *Art of Projecting* [Lee & Shepard, Boston]. The mirror must be fine plate, the thinner the better. For artificial lights we have electricity, the calcium light, acetylene, and oil. Electricity is most convenient and is cheap in operation, but is often unavailable; the calcium light is unexcelled but rather expensive; acetylene is excellent if the screen is not too large; oil lamps are apt to be ill-smelling and unsatisfactory generally. For pictures not exceeding five feet square I have used an ordinary acetylene bicycle lamp with great satisfaction, and think it superior to any oil light obtainable. The cost of running it is about five cents an hour.

The condensing lenses should be four and a half inches in diameter. They may be bought mounted or unmounted. If unmounted, the cost need not exceed \$5 or \$6 a pair. I have on two occasions made serviceable mounts with pieces of shingle, a jack-knife and some brads. On a turning lathe neat wood mounts can be made very easily that will answer every purpose. For sunlight but one condenser is needed, as the rays of light are already parallel.

For a recitation room a "quarter-plate" projecting lens is generally best, costing from \$7 to \$10. If sunlight is used, any rectilinear photographic lens covering a 4×5 or 5×7 plate may be used with entire satisfaction.

For a screen, a solid white-plastered wall is best; a heavy white oil-finish window-shade on a tin spring roller is good, but expensive. As the next best thing, stretch the best quality of bleached sheeting tightly on a frame, cover it with a heavy coat of kalsomine, and hinge the upper edge of the frame to the ceiling, swinging the screen up by cords and pulleys when it is not in use. Plain sheeting can be used, but the coating of kalsomine increases the brilliancy of the picture some 25 per cent. For small screens a few feet square, I know of nothing superior to sheets of white carboard, matt surface, glued together by the edges to form the proper size. This can be had at any printing-office for a few cents a sheet.

If the lantern is to be used at a fixed distance from the screen, a bellows is unnecessary, and the body of the lantern may be made of cardboard and tin—that is, if one is getting up a lantern at the lowest possible cost.

If expense does not have to be considered too closely, for regular school use an electric stereopticon is undoubtedly the most desirable, but one should be chosen in which the two carbons are at right angles. With an *alternating* current, however, any electric lantern will make a most objectionable buzzing.

3. *Slides*.—Thousands of slides are listed by dealers in this country and in Europe, but often one will desire to have slides not to be found in any list, as of local points on physiography, or from illustrations and photographs. Anyone familiar with photography can readily learn to make slides; often some pupil may be found who is willing to do the work. In case of a drawing or photograph, a negative must first be made. A very slow plate is most satisfactory for this purpose. For copying, the common hand cameras are unsuitable, not so much because of the kind of lenses as for the reason that the bellows is too short to make a copy anywhere near the same size as the original. Time forbids a discussion of the details of slide-making—full directions may be found in any photographic instruction book. Suffice it to say, the work is fascinating and comparatively inexpensive.

4. *In what classes may slides be used?*—The lantern can be used to very great advantage in classes in physiography, in history, and in connection with work in Latin and Greek. The need of illustration in physiography is great, inasmuch as no one locality, and usually no one section, furnishes actual examples of all formations. For instance, what idea from direct observation can most Michigan pupils get of stratification on a grand scale and of the resulting forms and contours due to erosion? But with a lantern the cañons and plateaus of the West can be brought before their eyes. Again, what idea of wave and coast erosion can pupils get who live at a distance from any large body of water?

In modern history the amount of material is endless—places,

buildings, persons, etc. But the need of illustration in ancient history is far greater, inasmuch as it is far harder to comprehend in terms of the life of today. Views of the statues from Egypt, tomb paintings, hieroglyphics—all these will give tangible things to remember. Much the same may be said of Chaldea and Assyria. A talk, not too technical, on the art of these countries will arouse interest. In Greek history, very much can be done, for we have abundant material in views of extant ruins and in pictures of famous localities. What pupil is not intensely interested in seeing the pass of Thermopylæ, Olympia, and the ruins of the Acropolis? It seems to me that illustrations in connection with Greek come in more naturally in connection with Greek history than with the study of the language itself, but others may have a different view.

English is a prolific field for lantern work. When pupils are reading the *House of the Seven Gables*, show them views of Salem; when they have the *Merchant of Venice*, take them to Stratford to see the country of Shakespeare. I have but time to say that teachers of botany, zoölogy, physiology, and astronomy will find the lantern an invaluable aid.

5. *Slides in connection with work in Latin.*—I now come to my last, and, from a personal point of view, most important topic—the lantern in connection with Latin work. What I have said of the need of illustration in teaching a thing remote in time or place from the pupil needs here to be emphasized. Strange as it may seem to some of us, I venture to say that a great number—I hope not a majority—of our high-school pupils have no vivid conception of the Romans as actual flesh and blood men; Cæsar and Cicero are but ghostly figures compared with Washington and Lincoln. I myself well remember what amazement overtook me when in a college course in Plautus I actually realized that the Romans indulged in ordinary conversation and even in slang, and did not invariably use the military conciseness of Cæsar, the oratorical finish of Cicero, or the euphonious hexameters of Virgil. Of course I knew as an abstract fact that the Romans lived, loved, and hated, but, to use an expressive phrase, I did not “sense it” till long after my high-school days.

Here, then, we have what I believe is the greatest bar to arousing the liveliest interest on the part of our classical pupils, namely, the difficulty in making pupils fully realize and feel that the great characters of Roman life and history were men—men of like passions with ourselves. Once get pupils to realize this, and I believe the question of interest will thenceforth take care of itself.

As regards the lines in which slides may be profitably used in the four years of Latin, ideas will differ, but I will indicate briefly what may be a good arrangement. In the first year of Latin, choose anything that will be of interest. Make this, not scientific information, the main object. While I am not inclined to think that children have the inborn antipathy to declensions and conjunctions some would have us believe, yet I believe that every effort should be made in the first year to interest Latin pupils. To that end, one may talk at one time of Pompeii in general, again tell of the home life of the Romans, show slides of paintings, especially of the delightful compositions of the Coomans. Take your class for a walk around Rome—and don't be too scientific, too technical. Be accurate, of course, but bear in mind that pupils at this age do not care whether a wall painting is of the first or the fourth style, or whether a given modern painting is correct in all its details when scrutinized with an archæological microscope. Tell the stories Livy tells, showing slides of paintings and drawings—never mind if Mommsen, Niebuhr, Freeman, and historians generally, do relegate these tales to the realm of myths.

In the second year the average pupil studies Cæsar, for Cæsar is still firmly intrenched in the second year of our high schools. Here let me digress just long enough to say that in the discussion over second-year Latin I am emphatically a Cæsarian; if, by pupils, he is found a dry and tedious author, the key to the trouble is to be sought, not in Cæsar, but in the teacher who himself regards the *Commentaries* as an anhydrous literary petrification.

But to return to my text: The most natural course here would be to use a series of slides illustrating the topography of

the Gallic war, giving the battlefields in detail. Unfortunately no such series is yet available for school use. From personal experience in my own classes I can vouch that the use of such slides immensely enhances interest in the subject. Of a few of the localities photographs may be had from regular dealers. Then the Roman art of war will furnish considerable material—slides of the sculptures of Trajan's column, for instance, and also of the pieces (restorations) of Roman "artillery" in the Musée St. Germain, near Paris. Historical paintings will also give us numerous slides relative to the life and death of Cæsar. A few views of the Forum Romanum might also well be shown. One talk may profitably be given to the writing of the Romans, and slides of some of the extant manuscripts of Cæsar will be decidedly interesting.

In the third year, in connection with Cicero, a somewhat careful study of the Forum Romanum is akin to the subject. Here I should enter a plea for the free use of restorations. Granted that most are faulty, and like railway schedules, subject to change without notice, the fact remains that without the aid of such views our pupils will be quite unable to form any clear idea of ancient structures in their prime, for the reason that they have no stock of images of ancient buildings upon which to draw. So I would prefer even an incorrect restoration to none at all at this stage of instruction. The realization of ancient life more than compensates for slight errors of fact. A study of Rome itself in ancient times is naturally connected with a study of the Forum. Views of localities associated with the life of Cicero will add to the study of the author's biography.

In the fourth year, a wider range of topics may be presented. In connection with Virgil we may use views of localities mentioned in the *Æneid*, of the gods and goddesses as represented in Graeco-Roman sculpture, of paintings ancient and modern, and of manuscripts.¹ Aside from such work as this, wider excursions in Roman archæology will be appreciated by twelfth

¹ An interesting lot of photographs, suitable for the illustration of the first six books of VIRGIL'S *Æneid*, is given by MR. I. B. BURGESS in the SCHOOL REVIEW for 1895, pp. 391-393.

grade pupils. In this connection, the following subjects may be considered: Commemorative arches, a rather comprehensive study of the Roman house and its decoration, theaters and amphitheaters, the orders of architecture illustrated by extant ruins, Graeco-Roman sculpture, Roman portrait sculpture, tombs, sarcophagi and inscriptions, temples, etc. I would not wish to be understood as saying that all these should be used—a teacher may select what he thinks of most interest to the class, or may have to begin with a few slides illustrating one subject, later gradually adding to his stock. Probably no two teachers would pick out just the same slides or present just the same subjects.

It may be well for me to confess that in my own teaching I have not personally been able to follow out this scheme in its entirety, not because of lack of slides, but from want of time. I keep it in mind, however, as a thing to approximate as nearly as possible.

Someone may object that what has been said implies a far wider range of knowledge than the average secondary Latin teacher possesses. But does it imply any wider information than such a teacher *ought* to have? And should the instructor's knowledge be too limited, studying up some of these topics will prove the best possible thing for the teacher himself.

One point more, in conclusion. I am not urging that the lantern should be used daily or as a way to make a subject essentially easier. Far from it, for I am not a believer in the idea that the highest aim of a teacher should be to make a subject easy. Further, the pupil who leaves school without fully appreciating that most things worth doing require a deal of honest hard work, and who has not gained the power to apply himself energetically to a hard subject, has missed an essential part of education. The traveler who always seeks level or descending paths never gains the top of a mountain; the shortest path to the summit, both in distance and time, is often the steepest and hardest. Just so the pupil who always follows the line of least resistance will never develop the backbone necessary

to successful accomplishment in life. But I do maintain that the lantern used occasionally, either in the class hour or at some other time, is a most powerful agency in arousing and stimulating interest in the study of the classics. Once your pupil is interested, teaching Latin, or anything else, is easy.

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